

What is claimed is:

1. A method of recognizing a region corresponding to an image storage sheet, comprising the steps of:

5 i) obtaining a read-out image, which has been acquired by covering an image storage sheet that contains a color image with an image storage sheet pushing surface of a platen cover and reading out an image of a region on the image storage sheet pushing surface of the platen cover, the region on the image storage sheet pushing surface containing the image storage sheet, and

10 ii) recognizing a region corresponding to the image storage sheet in the read-out image,

15 wherein the image storage sheet pushing surface of the platen cover has a color other than colors which are ordinarily contained in image storage sheets, and

20 the region corresponding to the image storage sheet is recognized by judging that a pixel in the read-out image, which pixel represents a color different from the color of the image storage sheet pushing surface of the platen cover, is a pixel falling within the region corresponding to the image storage sheet.

2. A method of recognizing a region corresponding to an image storage sheet as defined in Claim 1 wherein the image storage sheet is a color photoprint.

25 3. A method of recognizing a region corresponding to an image storage sheet as defined in Claim 2 wherein the color

of the image storage sheet pushing surface of the platen cover is a color outside a chromaticity range, which chromaticity range is approximately circumscribed with one of the following regions on $L^*a^*b^*$ chromaticity diagrams illustrating chromaticity coordinates (a^*, b^*):

(1) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-28, 15)$, $(15, 15)$, $(32, -43)$, and $(13, -43)$ as for a lightness of $L^*=5$,

(2) a triangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-33, 20)$, $(14, 20)$, and $(47, -92)$ as for a lightness of $L^*=10$,

(3) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-37, 20)$, $(26, 20)$, $(54, -73)$, and $(30, -75)$ as for a lightness of $L^*=15$,

(4) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-38, 20)$, $(35, 26)$, $(57, -68)$, and $(17, -72)$ as for a lightness of $L^*=20$,

(5) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-46, 26)$, $(44, 34)$, $(62, -64)$, and $(6, -70)$ as for a lightness of $L^*=25$,

(6) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of

(-57,33), (53,43), (67,-57), and (0,-68) as for a lightness of $L^*=30$,

(7) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-62,40), (61,51), (73,-56), and (-17,-62) as for a lightness of $L^*=35$,

(8) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-68,47), (57,58), (82,-52), and (-51,-57) as for a lightness of $L^*=40$,

(9) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-63,54), (53,54), (56,-47), and (-50,-53) as for a lightness of $L^*=45$,

(10) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-50,63), (46,71), (72,-45), and (-60,-48) as for a lightness of $L^*=50$,

(11) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-43,71), (39,76), (63,-41), and (-56,-44) as for a lightness of $L^*=55$,

(12) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-33,80), (31,85), (55,-36), and (-54,-39) as for a lightness of $L^*=60$,

(13) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-22, 91)$, $(24, 91)$, $(47, -32)$, and $(-49, -34)$ as for a lightness of $L^*=65$,

5 (14) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-11, 98)$, $(17, 98)$, $(40, -27)$, and $(-46, -27)$ as for a lightness of $L^*=70$,

10 (15) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-5, 122)$, $(6, 123)$, $(29, -23)$, and $(-41, -23)$ as for a lightness of $L^*=75$,

15 (16) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-6, 103)$, $(5, 103)$, $(22, -17)$, and $(-28, -17)$ as for a lightness of $L^*=80$,

20 (17) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-7, 69)$, $(4, 70)$, $(19, -15)$, and $(-17, -15)$ as for a lightness of $L^*=85$, and

(18) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-4, 48)$, $(7, 48)$, $(15, -12)$, and $(-12, -12)$ as for a lightness of $L^*=90$.

25 4. A method of recognizing a region corresponding to an image storage sheet, comprising the steps of:

i) obtaining a read-out image, which has been acquired by covering an image storage sheet that contains a color image with an image storage sheet pushing surface of a platen cover and reading out an image of a region on the image storage sheet pushing surface of the platen cover, the region on the image storage sheet pushing surface containing the image storage sheet, and

ii) recognizing a region corresponding to the image storage sheet in the read-out image,

wherein the image storage sheet pushing surface of the platen cover has a periodical pattern, which is composed of a plurality of different color areas arrayed in a predetermined order and in abutment with one another, and

the region corresponding to the image storage sheet is recognized by judging that a pixel in the read-out image, which pixel represents an image different from the periodical pattern, is a pixel falling within the region corresponding to the image storage sheet.

5. A method of recognizing a region corresponding to an image storage sheet as defined in Claim 4 wherein a size of each of the color areas in the periodical pattern falls within the range of 0.1mm square to 1mm square.

6. A method of recognizing a region corresponding to an image storage sheet as defined in Claim 4 wherein one period in the periodical pattern falls within the range of a value two times as large as a spatial resolving power of the read-out image

to a value 20 times as large as the spatial resolving power of the read-out image.

7. An image processing method, comprising the step of modeling a shape, which expresses boundaries of a region having been recognized as the region corresponding to the image storage sheet with a method of recognizing a region corresponding to an image storage sheet as defined in Claim 1, 2, 3, 4, 5, or 6, into a predetermined shape.

8. An image processing method as defined in Claim 7 wherein an image of the region, which has been modeled into the predetermined shape, is located within a frame of a template, which has been prepared previously, and a template-appended image is thereby formed.

9. An apparatus for recognizing a region corresponding to an image storage sheet, comprising:

i) means for obtaining a read-out image, which has been acquired by covering an image storage sheet that contains a color image with an image storage sheet pushing surface of a platen cover and reading out an image of a region on the image storage sheet pushing surface of the platen cover, the region on the image storage sheet pushing surface containing the image storage sheet, and

ii) recognition means for recognizing a region corresponding to the image storage sheet in the read-out image,

wherein the read-out image is an image having been read out by utilizing the platen cover provided with the image

storage sheet pushing surface having a color other than colors which are ordinarily contained in image storage sheets, and

the recognition means recognizes the region corresponding to the image storage sheet by judging that a pixel in the read-out image, which pixel represents a color different from the color of the image storage sheet pushing surface of the platen cover, is a pixel falling within the region corresponding to the image storage sheet.

10. An apparatus for recognizing a region corresponding to an image storage sheet, comprising:

i) means for obtaining a read-out image, which has been acquired by covering an image storage sheet that contains a color image with an image storage sheet pushing surface of a platen cover and reading out an image of a region on the image storage sheet pushing surface of the platen cover, the region on the image storage sheet pushing surface containing the image storage sheet, and

ii) recognition means for recognizing a region corresponding to the image storage sheet in the read-out image,

wherein the read-out image is an image having been read out by utilizing the platen cover provided with the image storage sheet pushing surface having a periodical pattern, which is composed of a plurality of different color areas arrayed in a predetermined order and in abutment with one another, and

the recognition means recognizes the region corresponding to the image storage sheet by judging that a pixel

in the read-out image, which pixel represents an image different from the periodical pattern, is a pixel falling within the region corresponding to the image storage sheet.

11. An image processing apparatus, comprising
5 modeling means for modeling a shape, which expresses boundaries of a region having been recognized as the region corresponding to the image storage sheet with an apparatus for recognizing a region corresponding to an image storage sheet as defined in Claim 9 or 10, into a predetermined shape.

10 12. An image processing apparatus as defined in Claim 11 further comprising image forming means for locating an image of the region, which has been modeled by the modeling means into the predetermined shape, within a frame of a template, which has been prepared previously, and thereby forming a template-
15 appended image.

13. A platen cover for use in an apparatus for reading
out an image from an image storage sheet, the platen cover comprising an image storage sheet pushing surface having a color other than colors which are ordinarily contained in image storage
20 sheets containing color images.

14. A platen cover for use in an apparatus for reading
out an image from an image storage sheet, the platen cover comprising an image storage sheet pushing surface having a color outside a chromaticity range, which chromaticity range is
25 approximately circumscribed with one of the following regions on L*a*b* chromaticity diagrams illustrating chromaticity

coordinates (a^* , b^*):

(1) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-28,15), (15,15), (32,-43), and (13,-43) as for a lightness of $L^*=5$,

(2) a triangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-33,20), (14,20), and (47,-92) as for a lightness of $L^*=10$,

(3) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-37,20), (26,20), (54,-73), and (30,-75) as for a lightness of $L^*=15$,

(4) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-38,20), (35,26), (57,-68), and (17,-72) as for a lightness of $L^*=20$,

(5) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-46,26), (44,34), (62,-64), and (6,-70) as for a lightness of $L^*=25$,

(6) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of (-57,33), (53,43), (67,-57), and (0,-68) as for a lightness of $L^*=30$,

(7) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^* , b^*) of

(-62,40), (61,51), (73,-56), and (-17,-62) as for a lightness of $L^*=35$,

(8) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-68,47), (57,58), (82,-52), and (-51,-57) as for a lightness of $L^*=40$,

(9) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-63,54), (53,54), (56,-47), and (-50,-53) as for a lightness of $L^*=45$,

(10) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-50,63), (46,71), (72,-45), and (-60,-48) as for a lightness of $L^*=50$,

(11) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-43,71), (39,76), (63,-41), and (-56,-44) as for a lightness of $L^*=55$,

(12) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-33,80), (31,85), (55,-36), and (-54,-39) as for a lightness of $L^*=60$,

(13) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-22,91), (24,91), (47,-32), and (-49,-34) as for a lightness of $L^*=65$,

(14) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-11, 98)$, $(17, 98)$, $(40, -27)$, and $(-46, -27)$ as for a lightness of $L^*=70$,

5 (15) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-5, 122)$, $(6, 123)$, $(29, -23)$, and $(-41, -23)$ as for a lightness of $L^*=75$,

10 (16) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-6, 103)$, $(5, 103)$, $(22, -17)$, and $(-28, -17)$ as for a lightness of $L^*=80$,

15 (17) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-7, 69)$, $(4, 70)$, $(19, -15)$, and $(-17, -15)$ as for a lightness of $L^*=85$, and

20 (18) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-4, 48)$, $(7, 48)$, $(15, -12)$, and $(-12, -12)$ as for a lightness of $L^*=90$.

25 15. A platen cover for use in an apparatus for reading out an image from an image storage sheet, the platen cover comprising an image storage sheet pushing surface having a periodical pattern, which is composed of a plurality of different color areas arrayed in a predetermined order and in abutment with one another.

16. A sheet for a platen cover, wherein one of opposite surfaces of the sheet has a color other than colors which are ordinarily contained in image storage sheets containing color images.

5 17. A sheet for a platen cover, wherein one of opposite surfaces of the sheet has a color outside a chromaticity range, which chromaticity range is approximately circumscribed with one of the following regions on $L^*a^*b^*$ chromaticity diagrams illustrating chromaticity coordinates (a^*,b^*) :

10 (1) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of $(-28,15)$, $(15,15)$, $(32,-43)$, and $(13,-43)$ as for a lightness of $L^*=5$,

15 (2) a triangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of $(-33,20)$, $(14,20)$, and $(47,-92)$ as for a lightness of $L^*=10$,

20 (3) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of $(-37,20)$, $(26,20)$, $(54,-73)$, and $(30,-75)$ as for a lightness of $L^*=15$,

(4) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of $(-38,20)$, $(35,26)$, $(57,-68)$, and $(17,-72)$ as for a lightness of $L^*=20$,

25 (5) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of

(-46,26), (44,34), (62,-64), and (6,-70) as for a lightness of $L^*=25$,

(6) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-57,33), (53,43), (67,-57), and (0,-68) as for a lightness of $L^*=30$,

(7) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-62,40), (61,51), (73,-56), and (-17,-62) as for a lightness of $L^*=35$,

(8) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-68,47), (57,58), (82,-52), and (-51,-57) as for a lightness of $L^*=40$,

(9) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-63,54), (53,54), (56,-47), and (-50,-53) as for a lightness of $L^*=45$,

(10) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-50,63), (46,71), (72,-45), and (-60,-48) as for a lightness of $L^*=50$,

(11) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*,b^*) of (-43,71), (39,76), (63,-41), and (-56,-44) as for a lightness of $L^*=55$,

(12) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-33, 80)$, $(31, 85)$, $(55, -36)$, and $(-54, -39)$ as for a lightness of $L^*=60$,

5 (13) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-22, 91)$, $(24, 91)$, $(47, -32)$, and $(-49, -34)$ as for a lightness of $L^*=65$,

10 (14) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-11, 98)$, $(17, 98)$, $(40, -27)$, and $(-46, -27)$ as for a lightness of $L^*=70$,

15 (15) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-5, 122)$, $(6, 123)$, $(29, -23)$, and $(-41, -23)$ as for a lightness of $L^*=75$,

20 (16) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-6, 103)$, $(5, 103)$, $(22, -17)$, and $(-28, -17)$ as for a lightness of $L^*=80$,

(17) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of $(-7, 69)$, $(4, 70)$, $(19, -15)$, and $(-17, -15)$ as for a lightness of $L^*=85$, and

25 (18) a quadrangular region surrounded by lines connecting points having chromaticity coordinates (a^*, b^*) of

(-4,48), (7,48), (15,-12), and (-12,-12) as for a lightness of $L^*=90$.

18. A sheet for a platen cover, wherein one of opposite surfaces of the sheet has a periodical pattern, which is composed of a plurality of different color areas arrayed in a predetermined order and in abutment with one another.

19. An apparatus for reading out an image from an image storage sheet, wherein the improvement comprises the provision of a platen cover as defined in Claim 13 or 14.

20. An apparatus for reading out an image from an image storage sheet, wherein the improvement comprises the provision of a platen cover as defined in Claim 15.

21. A recording medium, on which a program for causing a computer to execute a method of recognizing a region corresponding to an image storage sheet has been recorded and from which the computer is capable of reading the program,

wherein the program comprises the procedures for:

i) obtaining a read-out image, which has been read out by an apparatus for reading out an image from an image storage sheet as defined in Claim 19, and

ii) recognizing the region corresponding to the image storage sheet by judging that a pixel in the read-out image, which pixel represents a color different from the color of the image storage sheet pushing surface of the platen cover, is a pixel falling within the region corresponding to the image storage sheet.

22. A recording medium, on which a program for causing a computer to execute a method of recognizing a region corresponding to an image storage sheet has been recorded and from which the computer is capable of reading the program,

5 wherein the program comprises the procedures for:

i) obtaining a read-out image, which has been read out by an apparatus for reading out an image from an image storage sheet as defined in Claim 20, and

10 ii) recognizing the region corresponding to the image storage sheet by judging that a pixel in the read-out image, which pixel represents an image different from the periodical pattern, is a pixel falling within the region corresponding to the image storage sheet.